

## CLAIMS

What is claimed is:

1. A method for detecting a type of a disc loaded in a disc drive, the method comprising:
  - measuring an elapsed time between when a disc tray is in an open state and when the disc tray closes completely;
  - comparing the elapsed time with a predetermined reference value to provide a comparison result; and
  - identifying and distinguishing between the disc as one of a cartridge-type disc and a general-type disc not being in a cartridge based on the comparison result.
2. The method of claim 1, wherein the predetermined reference value is obtained by counting a time between when the disc tray is holding the general-type disc in the open state and when the disc tray closes completely and adding a predetermined error range to the time.
3. An apparatus of detecting a type of a disc loaded in a disc drive, the apparatus comprising:
  - a closing mechanism which is pressed by a user to outputs a signal indicating that a disc tray to be closed;
  - a load-end switch to be turned on when the disc tray is completely closed;
  - a counter to count an elapsed time between when the closing mechanism is pressed by the user and when the load-end switch is turned on; and
  - a controller which instructs the disc tray to close when receiving the signal from the closing mechanism and instructs the counter to start counting when the signal is received, instructs the counter to stop counting when the load-end switch is turned on, obtains a resulting count value, and determines that the disc is a cartridge-type disc when the resulting count value is greater than a predetermined reference value.
4. The apparatus of claim 3, wherein the predetermined reference value is obtained by counting a time between when the disc tray holding the general-type disc in an open state and when the disc tray closes completely and adding a predetermined error range to the time.

5. A method of detecting a type of a disc loaded in a disc drive, the method comprising:

- recording a start time when a disc tray supporting the disc starts closing from an open state;
- recording a stop time when the disc tray is completely closed;
- comparing a resulting count value with a predetermined reference value;
- determining that the disc is a cartridge-type disc when the resulting count value is greater than the predetermined reference value;
- detecting whether sensor holes formed on the cartridge-type disc are open or closed;

and

- recognizing a state of the disc based on the result of detecting the sensor holes.

6. The method of claim 5, wherein the predetermined reference value is obtained by counting a time between when the disc tray is holding a general-type disc in the open state and when the disc tray closes completely and adding a predetermined error range to the time.

7. An apparatus for detecting a type of a disc loaded in a disc drive, the apparatus comprising:

- a disc tray shaped to receive a cartridge-type disc and a general-type disc which is not in a cartridge;
- a disc loading mechanism to move the disc tray between a first position and a second position during a loading operation; and
- a disc detection and reproduction unit which detects and identifies a received disc on the tray as being one of the general-type disc and the cartridge-type disc according to an elapsed time for the disc tray to move between the first position and the second position during the loading operation, and which reproduces the received disc.

8. The apparatus of claim 7, wherein the disc loading mechanism comprises a motor to open or close the disc tray.

9. The apparatus of claim 7, wherein the disc detection and reproduction unit comprises:

- an eject-end switch which is turned on when the disc tray is in the first position;

a load-end switch which is turned on when the disc tray is in the second position; and  
a counter which counts the elapsed time between when the disc tray is in the first position and the eject-end switch is turned on and when the disc tray is in the second position and the load-end switch is turned on.

10. The apparatus of claim 9, wherein the eject-end switch is turned to a first state from a second state when the disc tray is in an open state and the load-end switch is turned to a first state from a second state when the disc tray is in a closed state, and the counter counts a time between when the eject-end switch is turned from the first state to the second state and when the load-end switch changes to the first state from the second state.

11. The apparatus of claim 9, wherein the counter counts an elapsed time between when the disc tray is an open state and when the disc tray closes completely.

12. The apparatus of claim 9, wherein the disc detection and reproduction unit drives a motor to open and close the disc tray, instructs the counter to start a counting operation when the disc tray begins to close, records a turn on signal from each of the eject-end switch and the load-end switch, instructs the counter to stop counting when the load-end switch is turned on, and compares a count value from the counter with a predetermined reference value.

13. The apparatus of claim 12, wherein the predetermined reference value is obtained by counting an elapsed time between when the disc tray is holding a general-type disc in an open state and when the disc tray closes completely.

14. The apparatus of claim 9, wherein the predetermined reference value has have a predetermined error range.

15. A computer readable medium encoded with processing instructions for implementing a method of detecting a type of disc loaded in a disc drive performed by a computer, the method comprising:

measuring an elapsed time between when a disc tray is in a first position and when the disc tray is in a second position;

comparing the elapsed time with a predetermined reference value to provide a comparison result; and

identifying and distinguishing between a disc received in the disc tray as one of a cartridge-type disc and a general-type disc not being in a cartridge according to the comparison result.

16. The computer readable medium of claim 15, wherein the predetermined reference value is obtained by counting a time between when the disc tray is holding the general-type disc in the open state and when the disc tray closes completely and adding a predetermined error range to the time.

17. A computer readable medium encoded with processing instructions for implementing a method of detecting a type of disc in a disc drive performed by a computer, the method comprising:

recording a start time when a disc tray supporting the disc starts closing from a first position;

recording a stop time when the disc tray is in a second position;

comparing a resulting count value with a predetermined reference value, the resulting count value being based on the recorded start time and the recorded stop time;

determining that the disc is a cartridge-type disc when the resulting count value is greater than the predetermined reference value; and

determining that the disc is a general-type disc when the resulting count value is less than or equal to the predetermined reference value, the general-type disc being a disc not included in a cartridge.

18. The computer readable medium of claim 17, wherein the predetermined reference value is obtained by counting a time between when the disc tray is holding a general-type disc in the open state and when the disc tray closes completely and adding a predetermined error range to the time.